

# Appendix A – Field Overview and Specifications



## Game Field Introduction

This document will provide BOM information and detailed specifications for the Official Competition Field.

Teams who do not need an “official” field should refer to the separate low-cost field guide for cost-reduction options. Teams assembling the full field should refer to the separate VEX Robotics Competition Tower Takeover Field Build Instructions.

Please note: this field utilizes the VEX Competition Field Perimeter (278-1501) developed by VEX Robotics. Instructions and specifications for this field perimeter are available in a separate document, and are important for the field assembly.

This document is divided up into three sections:

1. Field Overview
2. Field Bill of Materials
3. Field Specifications

There is also an accompanying STEP file which can be imported into most 3D modeling programs (i.e. Inventor, Sketchup, Solidworks, etc). This 3D model shows the “official” setup of a VEX Robotics Competition – Tower Takeover competition field, and also includes detailed models of individual field elements.

For additional game-play detail, please refer to the VEX Robotics Competition – Tower Takeover competition manual.

For more information on reducing costs on unofficial field construction, refer to the accompanying “Low Cost Field” section located online at [vexrobotics.com](http://vexrobotics.com).

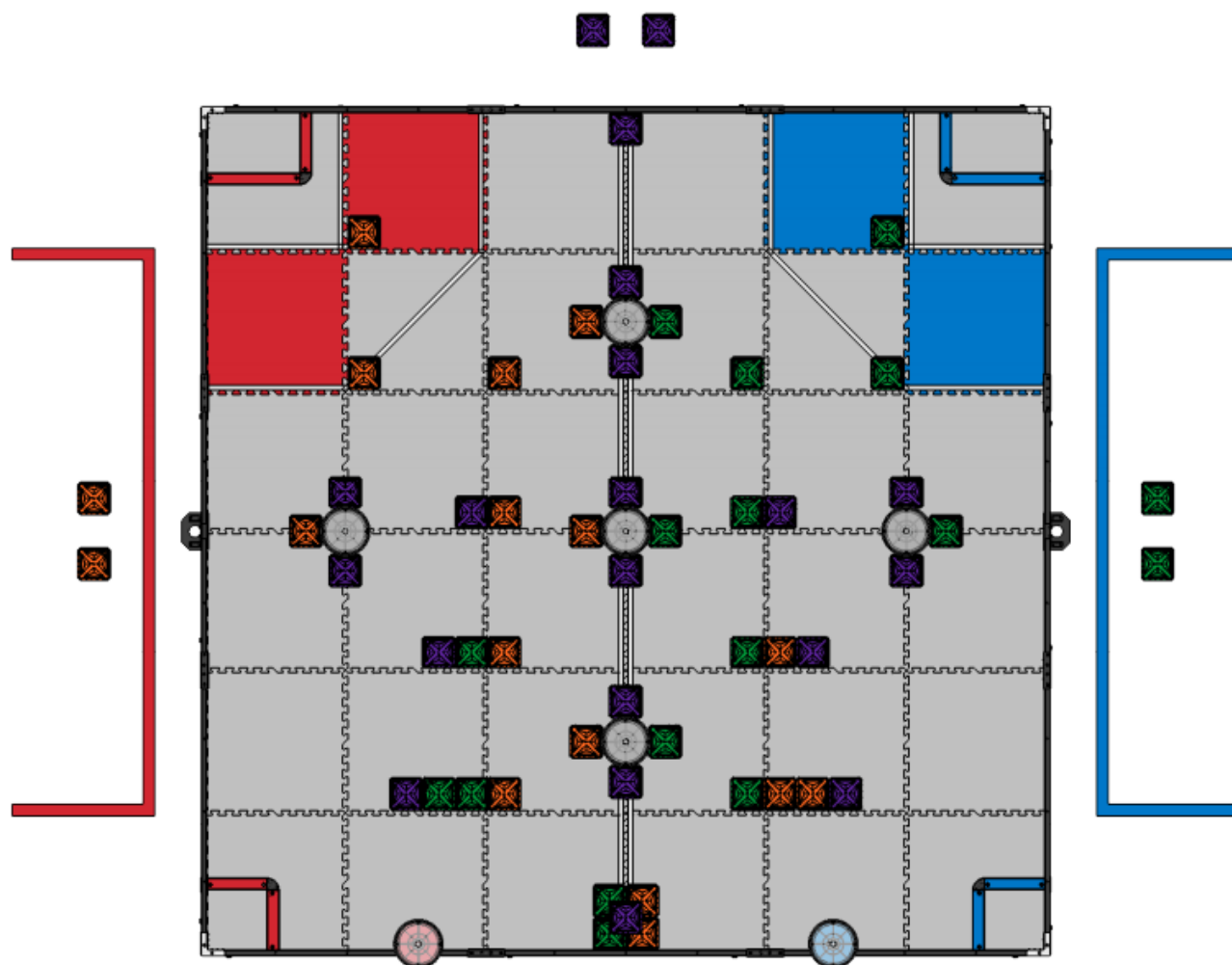


## VEX Robotics Competition Tower Takeover – Appendix A

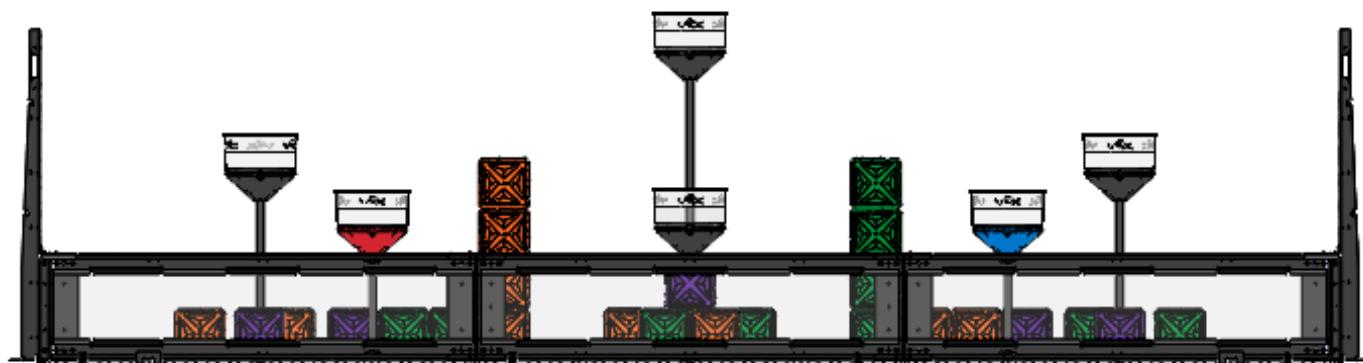
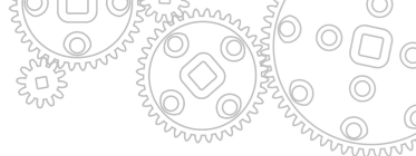
### Field Overview

The game VEX Robotics Competition – Tower Takeover is played on a 12ft x 12ft foam mat, surrounded by a sheet metal and polycarbonate perimeter, and divided in half by the tape *Autonomous Line*. Four *Scoring Zones* are in each corner of the field, two per *Alliance*. Two *Alliance Towers* are located along the front of the field. Five additional *Towers* are in the center of the field. Colored *Cubes* are in stacks throughout the *field* for use *by Robots*.

For more details and specific gameplay rules, please refer to the VEX Robotics Competition – Tower Takeover competition manual.



## VEX Robotics Competition Tower Takeover – Appendix A



### Game Objects & Field Bill of Materials

All of these items are available for purchase from: [www.vexrobotics.com](http://www.vexrobotics.com).

#### Generic Field Elements – Reusable Each Year

Part Number	Description
278-1501	VRC Field Perimeter Frame & Hardware
278-1502	VRC Foam Field Surface – (36) Grey, (2) Red, (2) Blue Tiles
275-1401	VRC VEXnet Field Controller

#### Official VEX Robotics Competition – Tower Takeover Specific Elements

Part Number	Description	Quantity per Full Field
276-6090	VRC 2019-2020 Game Element Kit	2
276-6091	VRC 2019-2020 Field Element Kit 1	1
276-6093	VRC 2019-2020 Field Element Kit 2	1

#### Practice Elements

Part Number	Description
276-6090	VRC 2019-2020 Game Element Kit
276-6092	VRC 2019-2020 Scoring Element Kit

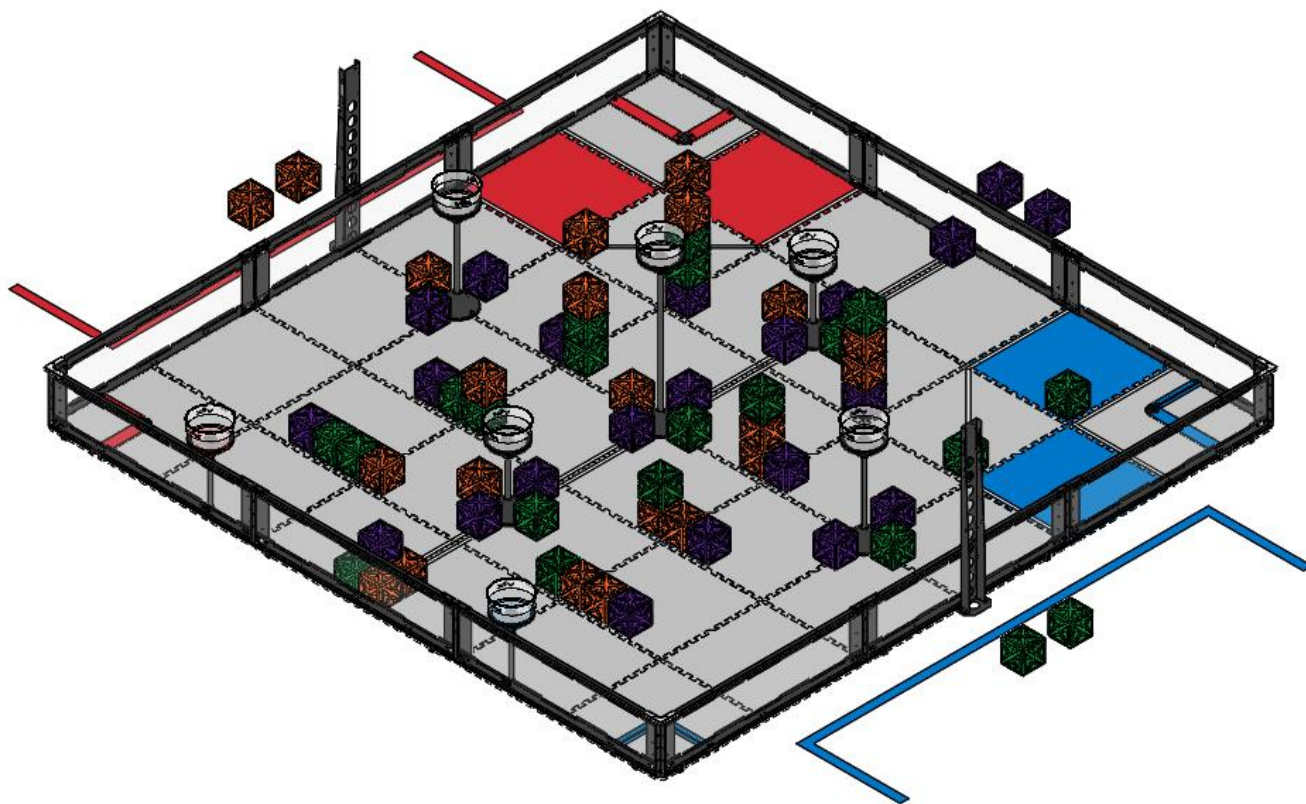


### Field Specifications Introduction

This section will outline the specifications that are most important to teams designing a robot to compete in the VEX Robotics Competition – Tower Takeover. Though many of the critical dimensions are included in this section, it may be necessary to consult the separate assembly guide and 3D CAD models of the field for an additional level of detail. If you can't find a dimension in the specifications, we include a full model of the field to "virtually" measure whatever dimension is necessary.

Field components may vary slightly from event to event. This is to be expected; teams will need to adapt accordingly. It is good design practice to create mechanisms capable of accommodating variances in the field and game pieces.

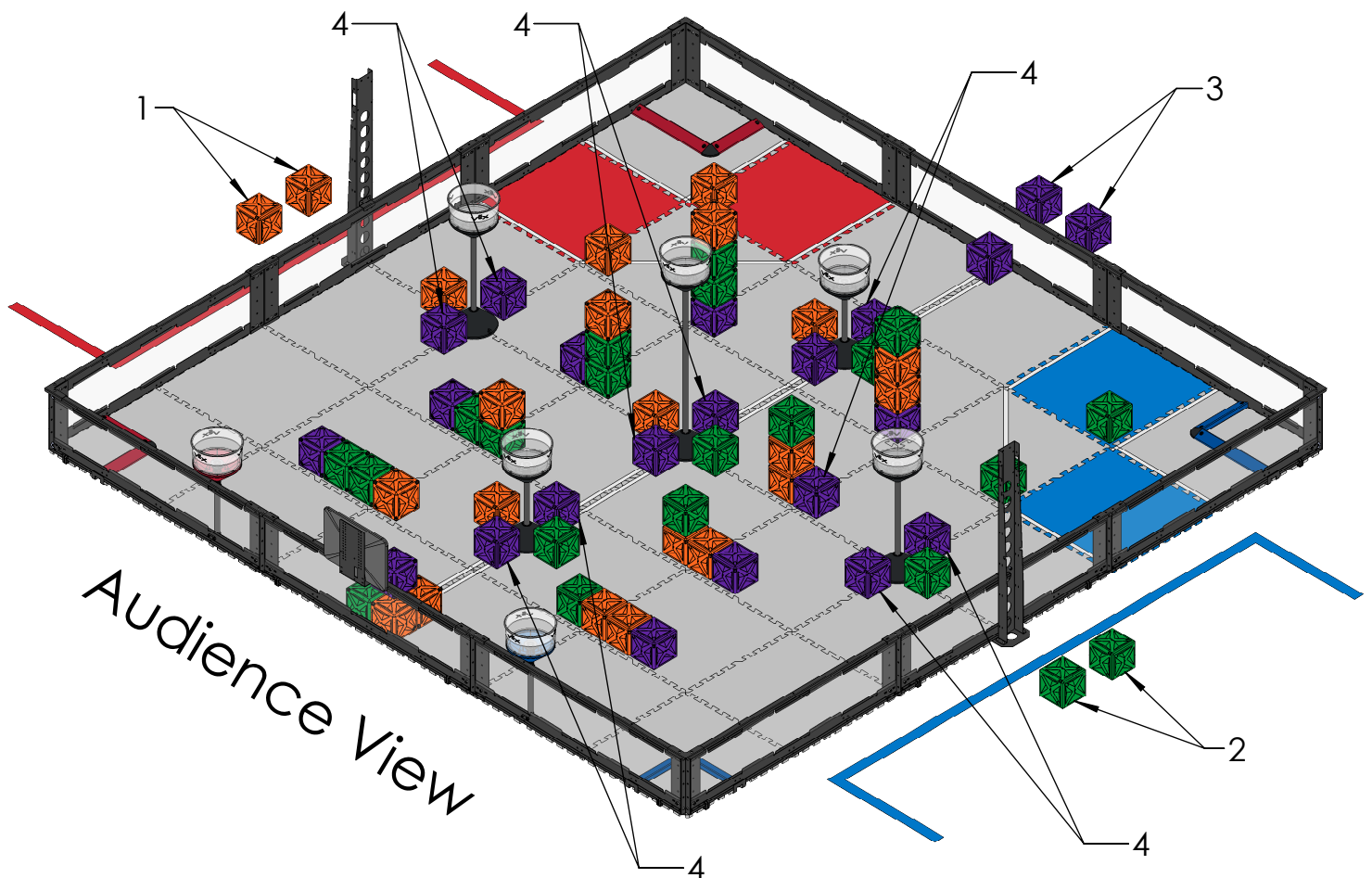
Note: Minor field repairs are permissible, provided that the repairs do not affect gameplay. Examples of minor field repairs include (but are not limited to) replacing broken PVC pipes or taping cracked plastic. Be sure to check the [Official Q&A](#) for specific examples or to get an official clarification.



**The Cubes are placed as follows before the start of each match.**

1. (1X) Orange Cube for Preload into each Red Alliance Robot.
2. (1X) Green Cube for Preload into each Blue Alliance Robot.
3. (2X) Purple Cubes placed off the field for Autonomous Bonus.
4. (2X) Purple Cubes placed touching either side of the base of each Tower parallel to the Alliance Station wall.

Additional Cube placements are described on the next page.

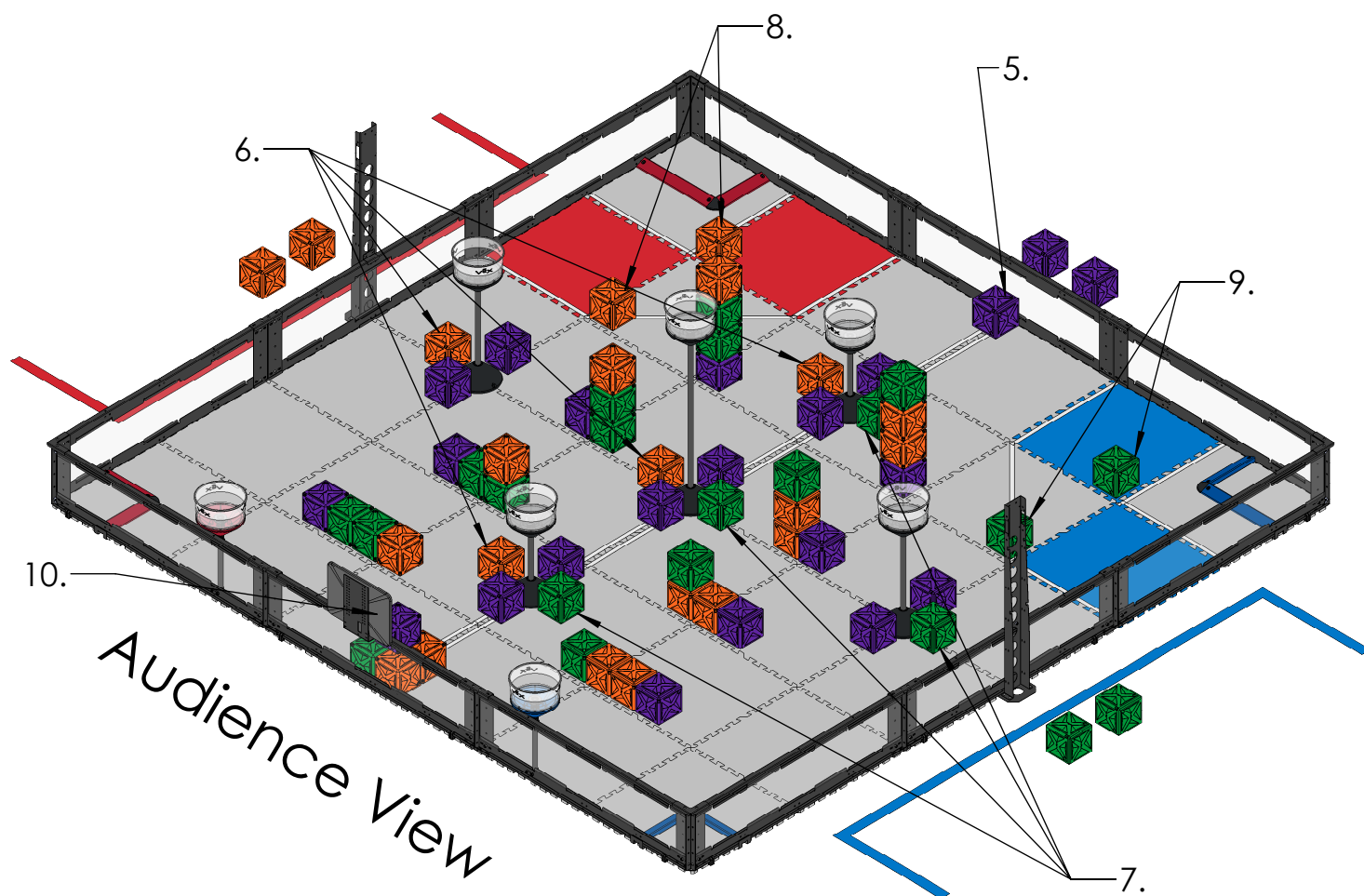




**The Cubes are placed as follows before the start of each match.**

5. (1X) Purple Cube centered on the wall furthest from the audience.
6. (1X) Orange Cube aligned perpendicular to the Alliance Station wall touching the base of each Tower on the side closest to the Red Alliance Station wall.
7. (1X) Green Cube aligned perpendicular to the Alliance Station wall touching the base of each Tower on the side closest to the Blue Alliance Station wall.
8. (2X) Orange Cubes aligned on the front outside corner of the furthest two tiles in the second row of tiles from the Red Alliance Station Wall.
9. (2X) Green Cubes aligned on the front outside corner of the furthest two tiles in the second row of tiles from the Blue Alliance Station Wall.
10. (2X) Green Cubes and (2X) Orange Cubes with (1X) Purple Cube arranged in a pyramid formation centered on the wall closest to the audience.

Additional Cube placements are described on the next page.



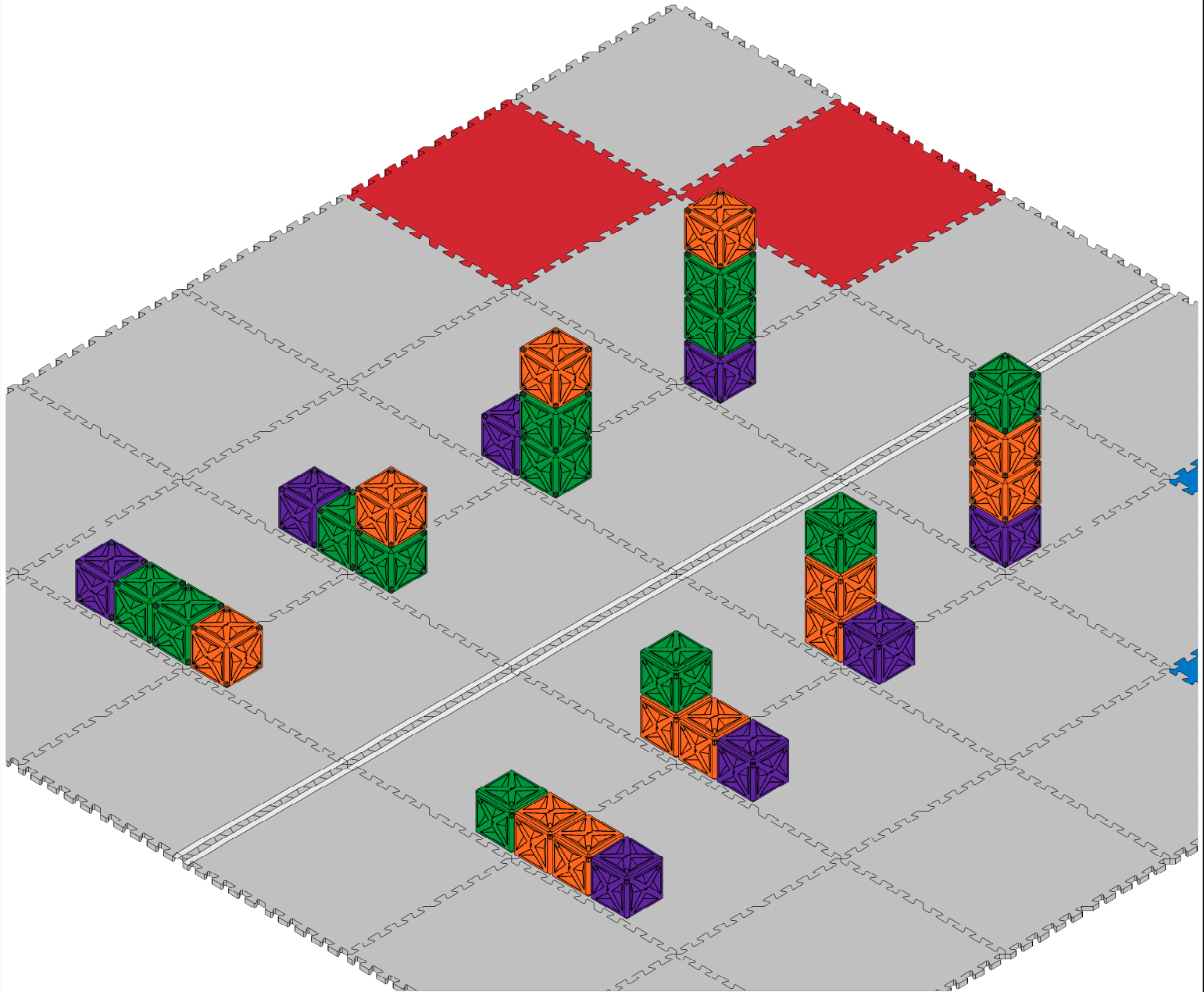
# Reference Object Placement Image:

The Cubes are placed as follows before the start of each match.

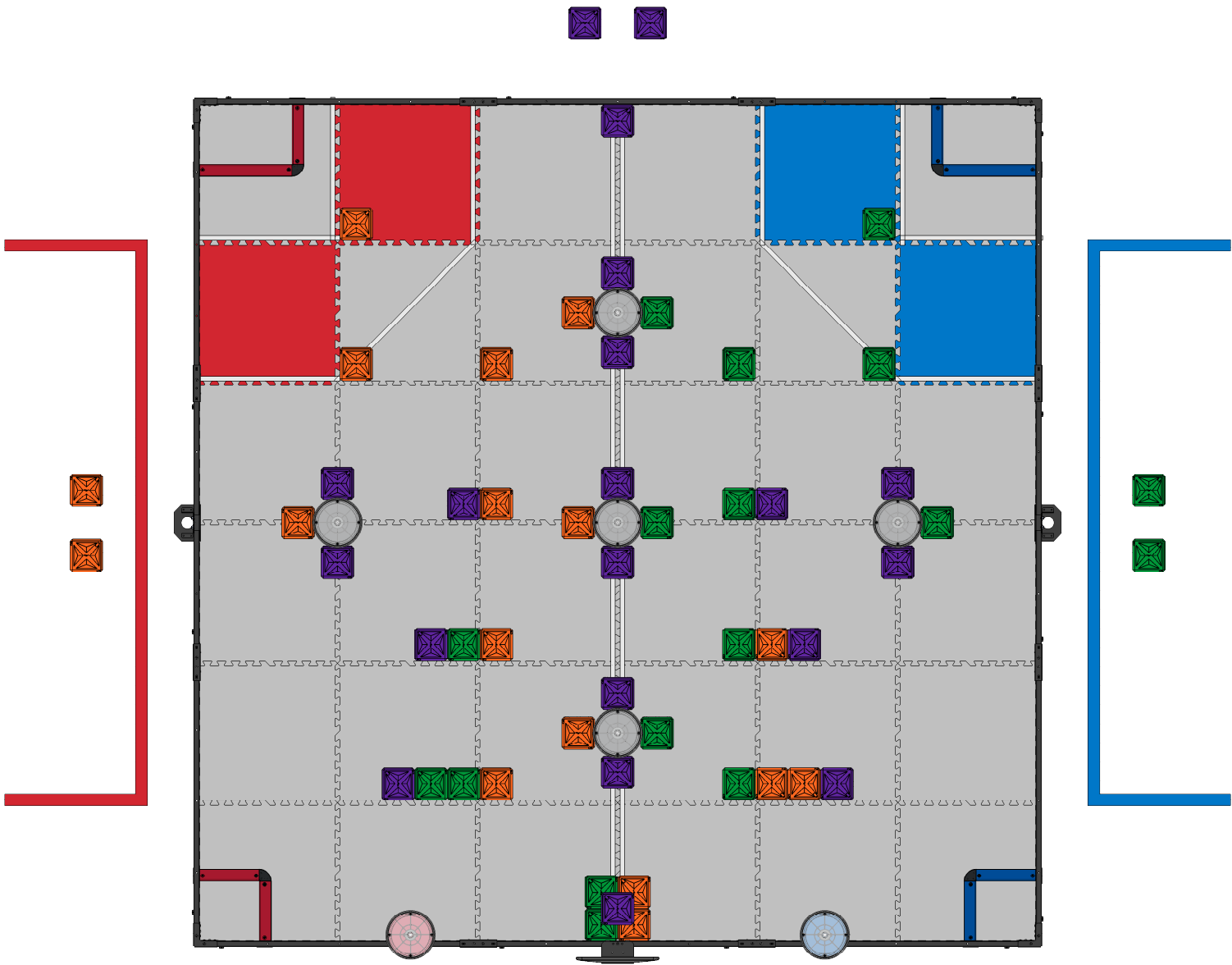
The stack of each of these patterns is placed on the centermost front corner of the field tile it is sitting on. The row placed next to it are directly horizontal from the stack moving towards the alliance station.

At the start of each Match, the patterns of Cubes are set up as shown below.  
 On the Red Alliance side of the field, the Cubes are in a pattern of Orange, Green, Green, Purple.  
 On the Blue Alliance side of the field, the Cubes are arranged in a pattern of Green, Orange, Orange, Purple.

Starting at the front of the field, the four Cubes are placed horizontally. Moving towards the back of the field, the first adjacent Cube is placed under the stack nearest the middle of the field.



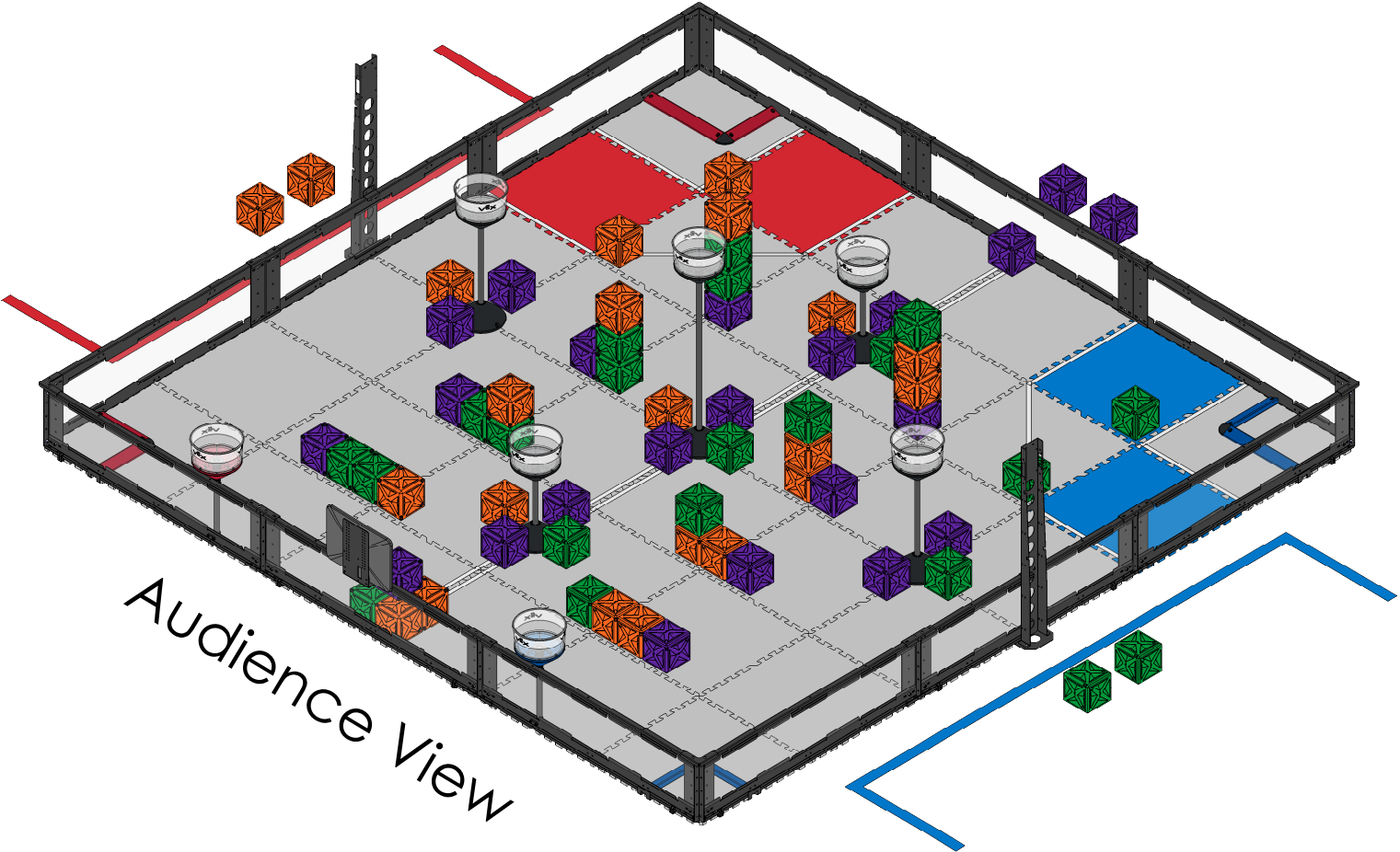
Reference Object Placement Image:




Audience View

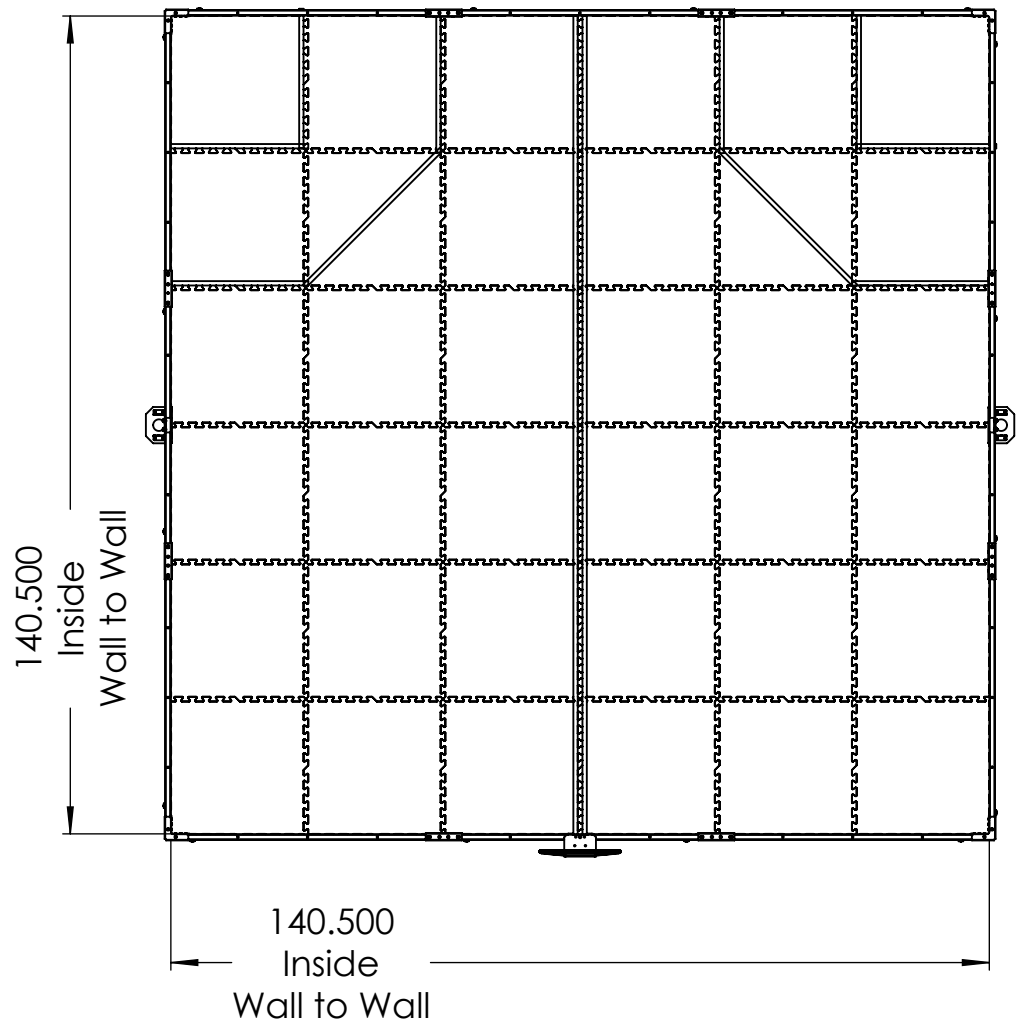
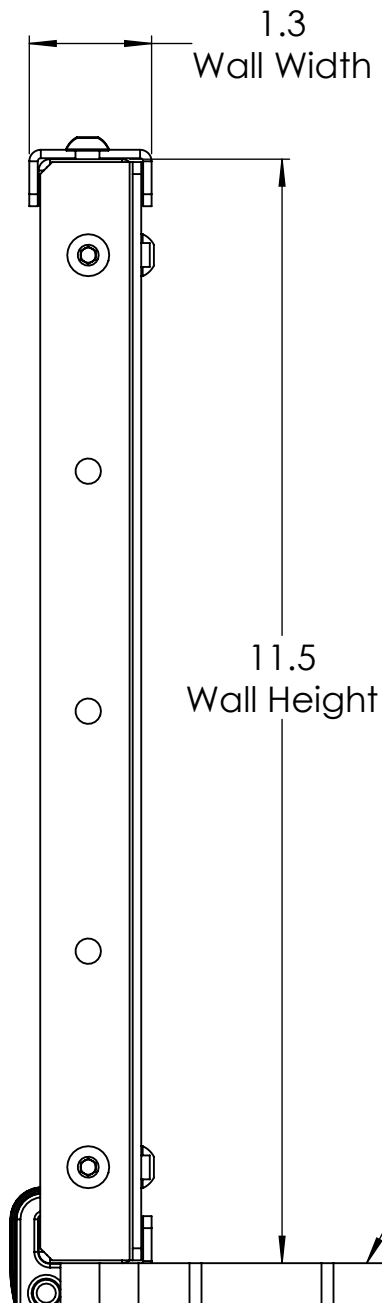


Reference Object Placement Image:



	Description 2019-2020 Game Object Placement(5)	
	Dwg No 276-6089-000 Rev1 Field Specifications	
	Competition VRC 2019-2020	Sheet 9 of 17
	Release 4/23/2019	ALL DIMENSIONS ARE IN INCHES.

## Field Critical Specs:



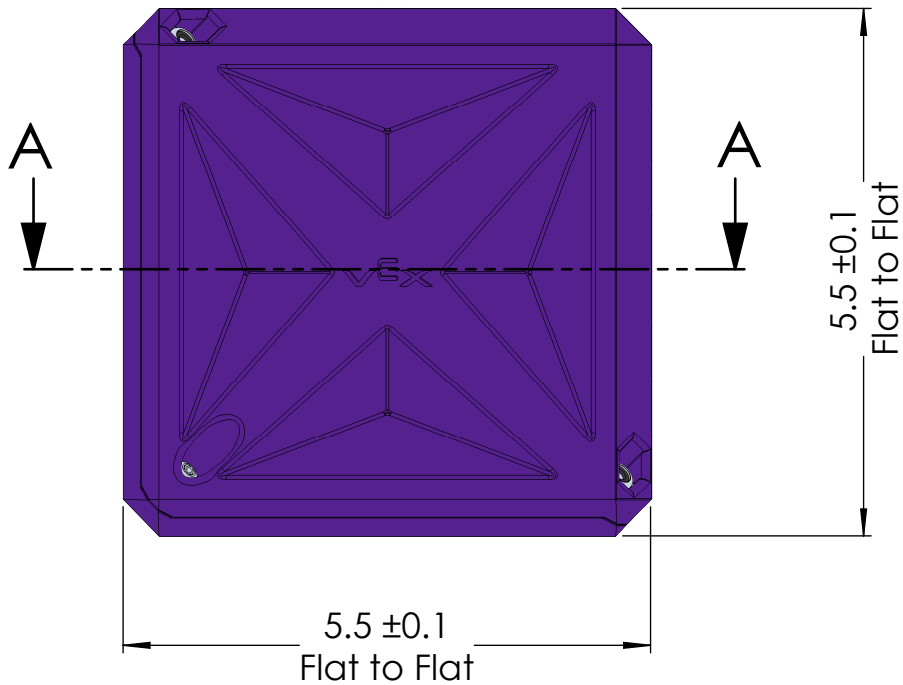
### Field Critical Dimensions:

- ~140.5" Square Wall to Wall, Inside
- 11.50" Wall Height
- 1.27" Wall Thickness

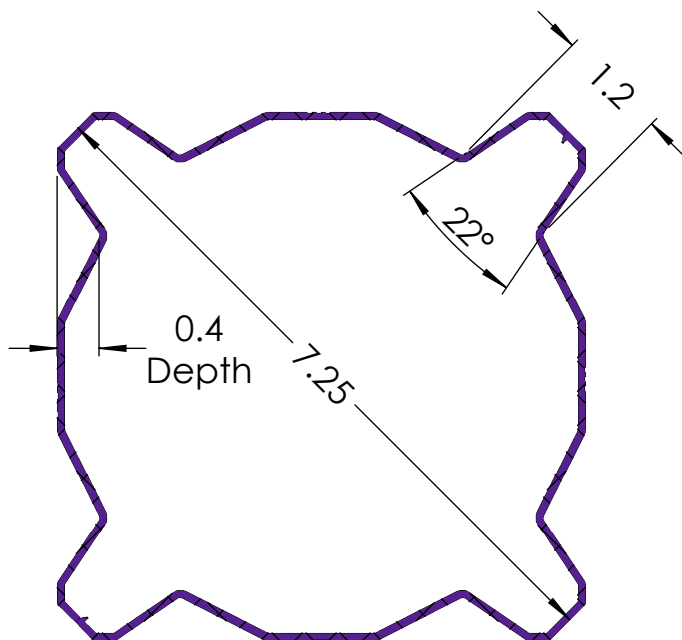
### NOTE:

Some events may elect to use Techspray 1726-QT, or a suitable replacement, to prevent static buildup on the foam tiles.

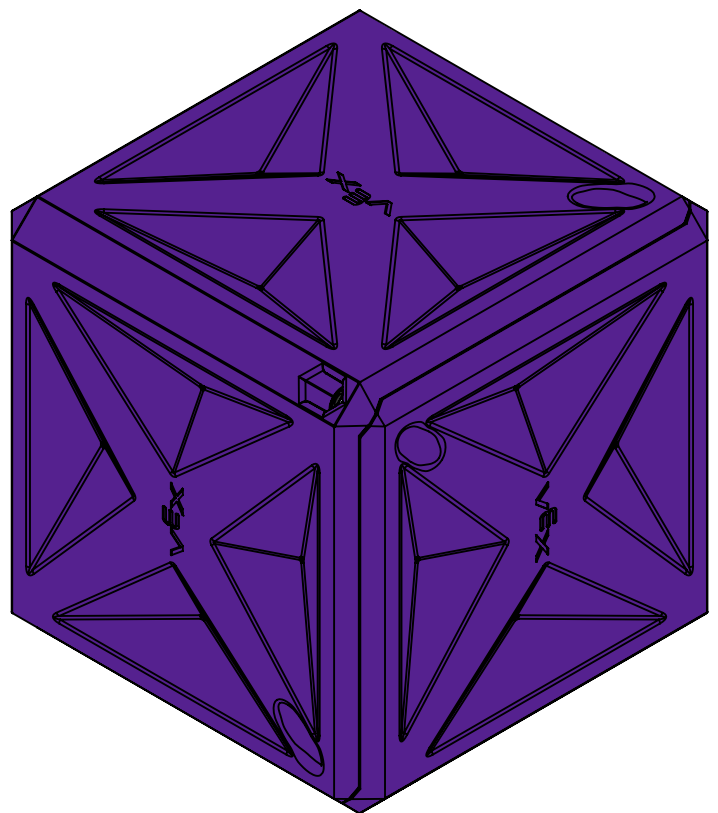
# Cube Specs:



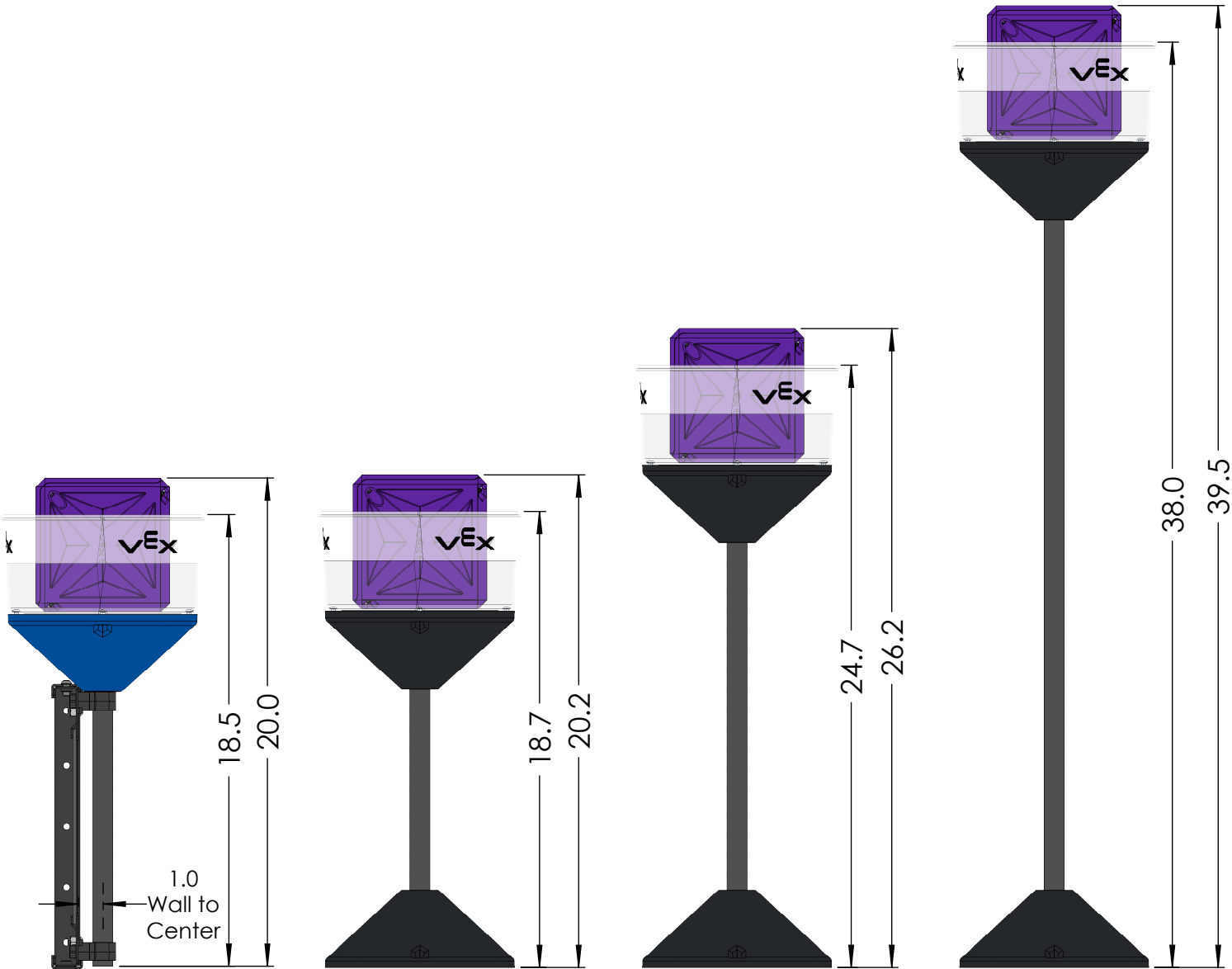
Cube Mass:  $285 \pm 10$  grams




SLICE SECTION A-A  
SCALE 1 : 2

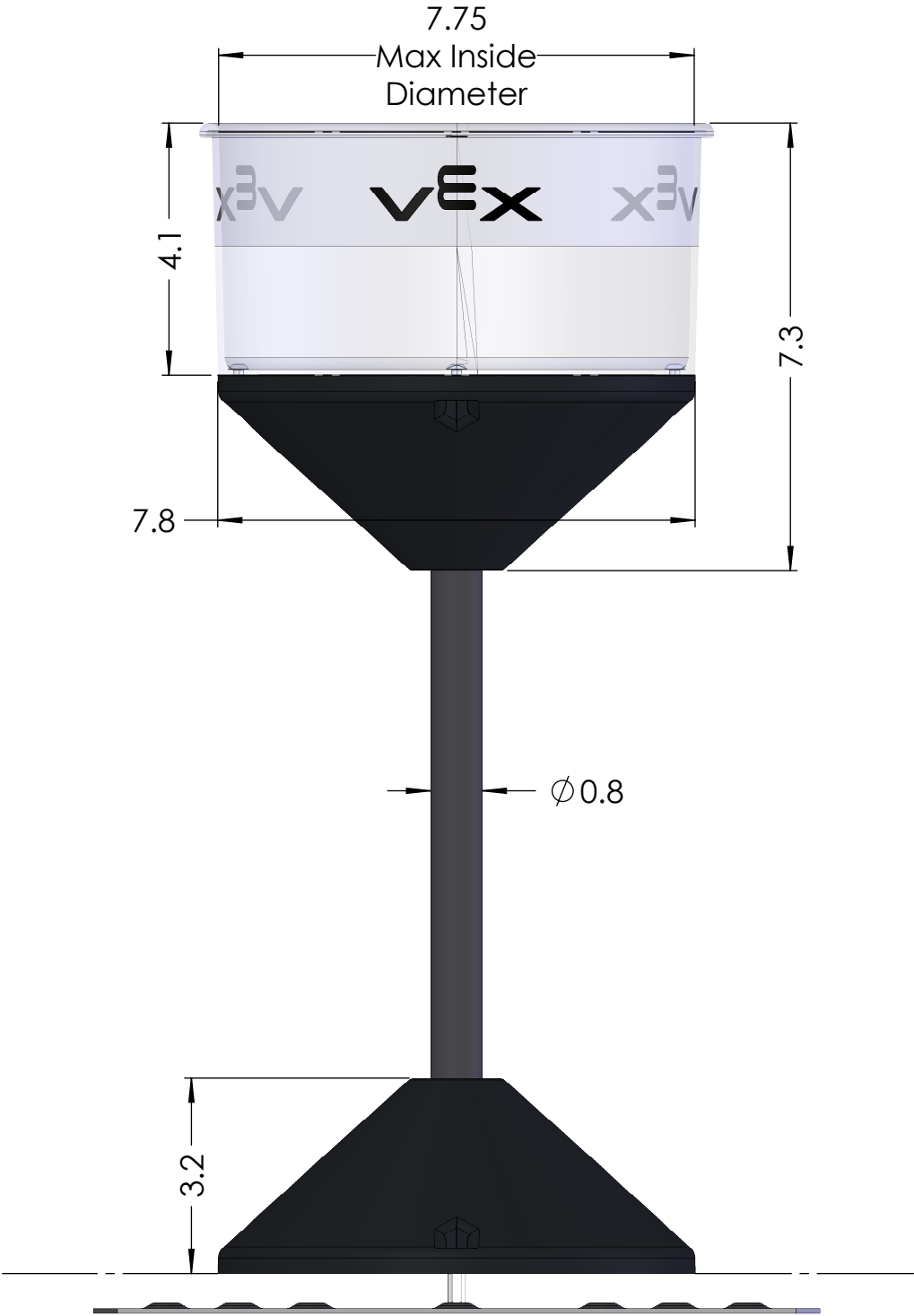


Tower Goal Specs (1):

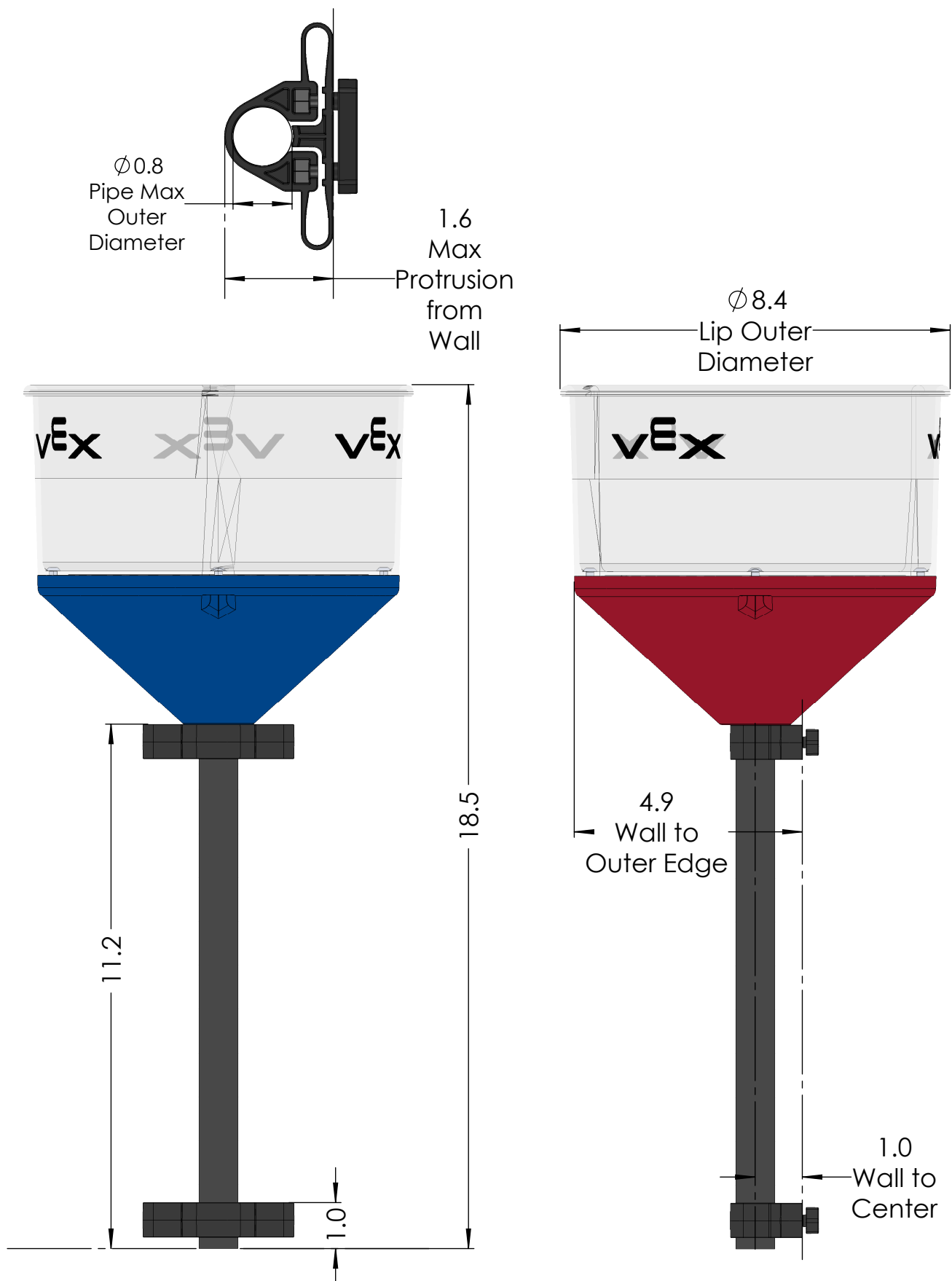


	Description 2019-2020 Game Specs (2)	
	Dwg No 276-6089-000 Rev1 Field Specifications	
	Competition VRC 2019-2020	Sheet 12 of 17
	Release 4/23/2019	ALL DIMENSIONS ARE IN INCHES.

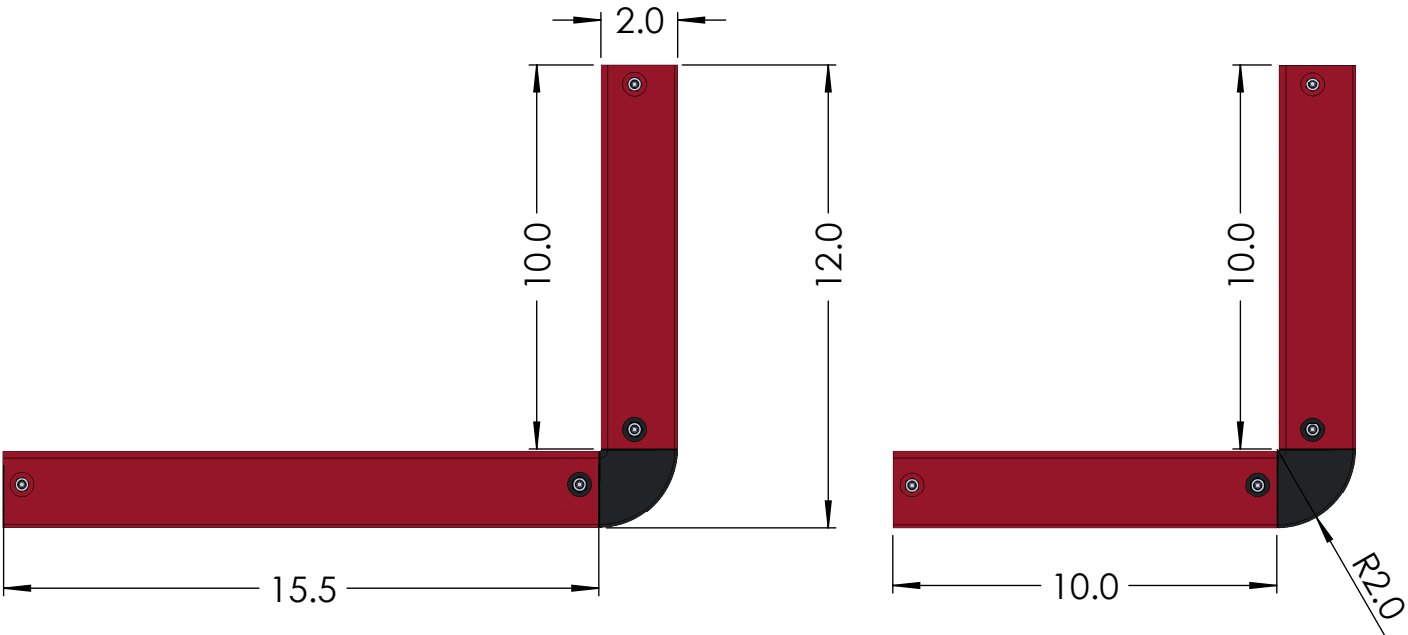
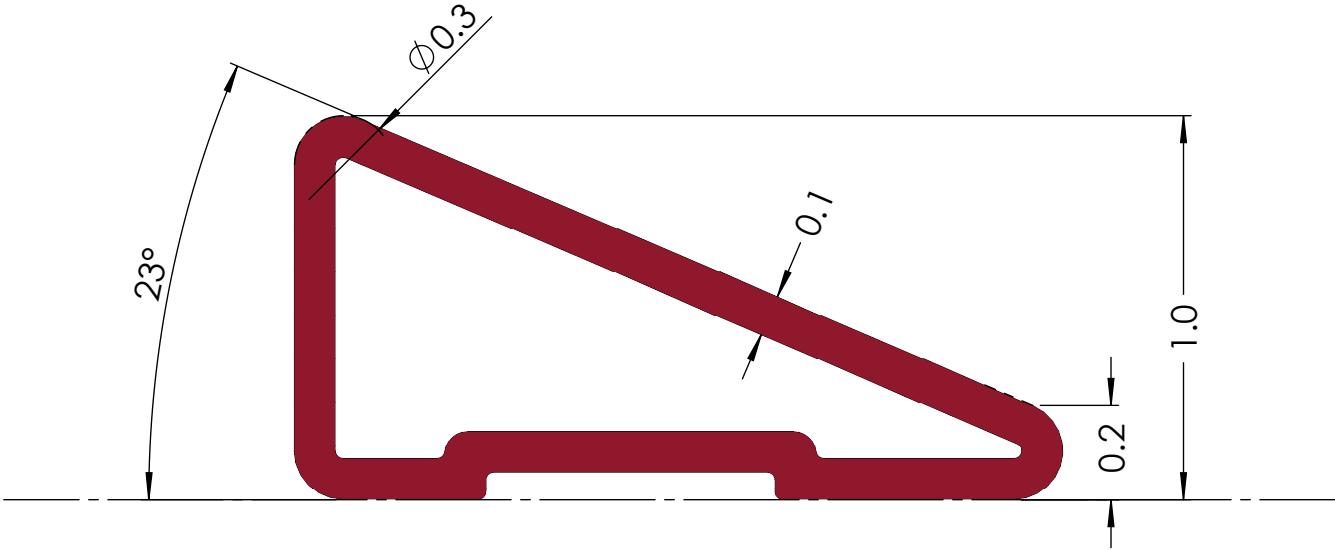
# Tower Goal Specs (2):

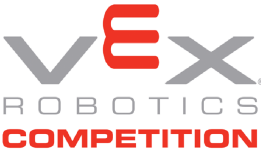




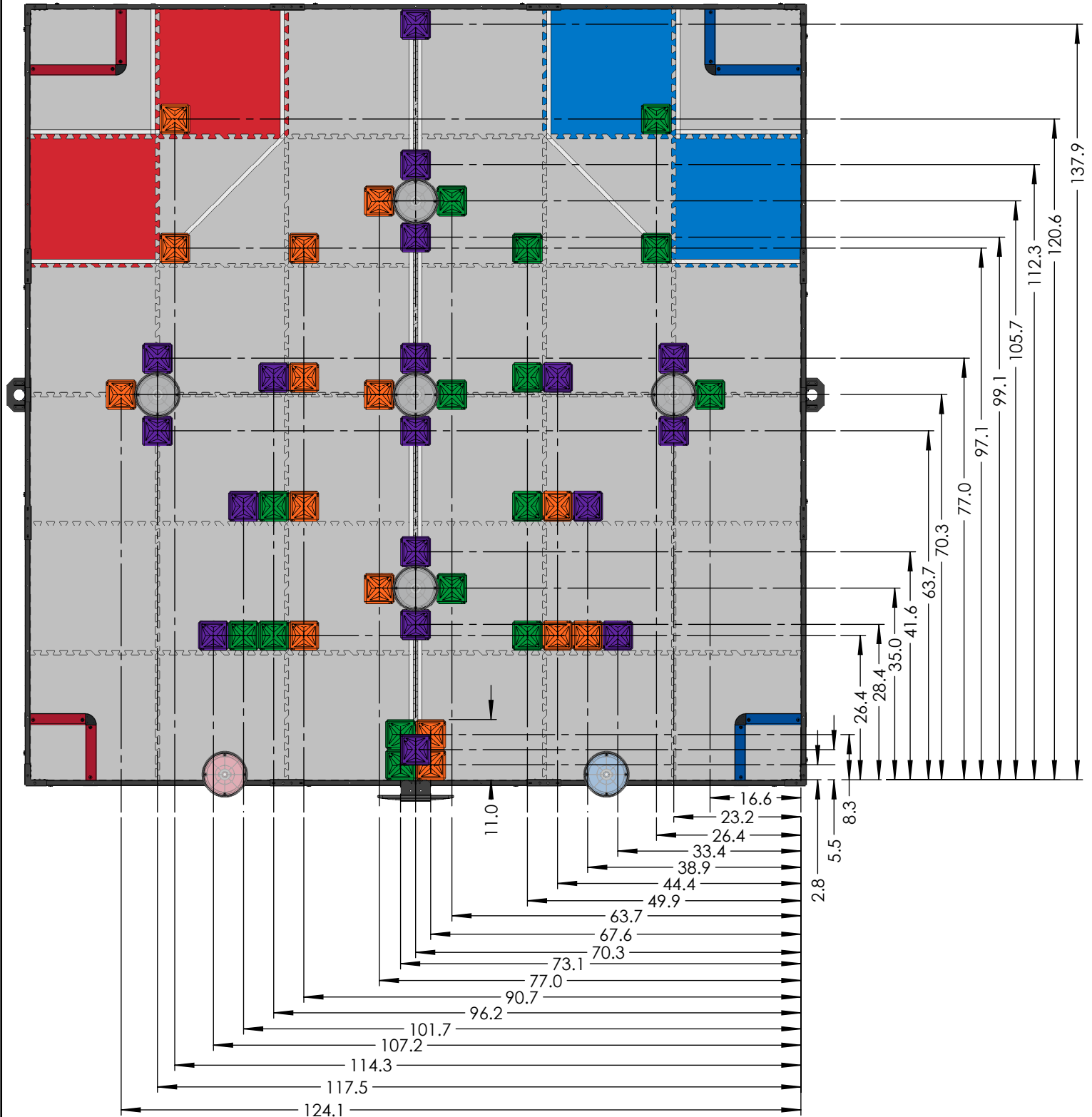


Floor Goals Specs:



	Description 2019-2020 Game Specs (5)		
	Dwg No 276-6089-000 Rev1 Field Specifications		
	Competition VRC 2019-2020	Sheet 15 of 17	
	Release 4/23/2019	ALL DIMENSIONS ARE IN INCHES.	

# Field Reference Specs



# Field Reference Specs

